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An X-ray Study on the Structure of Cobalt Dichloride Hexahydrate

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cleavage (001) surfaces of rock-salt in vacuum, the evaporation period having been changed in a wide range in case of the thickness kept at about 400Å, and the influence of the formation speed on the twinning in the films has been examined by electron diffraction and electron microscopy. The diffraction patterns have shown that the frequency of the twin formation is not seriously decreased by the lowest formation speed, but that imperfections such as bending or twisting of films are largely decreased. The interference fringes caused by the dynamical effect have been observed on the electron micrographs of slowly formed films. This fact means that the slow formation of films decreases also imperfections such as dislocations and vacancies and makes the lattice more perfect. The fringes are believed to be so-called equal thickness fringes originated from wedges due to the twin formation.

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Abstract

The crystal structure of $CoCl_2 \cdot 6H_2O$ has been determined by the X-ray single crystal method. The unit cell is monoclinic with $a=10.34$Å, $b=7.06$Å, $c=6.67$Å and $\beta=122°20'$. The space group is C_{2h}^3-C2/m and the unit cell contains two molecules. Two Cl^- ions and four water molecules are octahedrally coordinated to Co^{2+} ion to form the group $[CoCl_2 \cdot 4H_2O]$. These groups are held together parallel to the b axis by O···H-O type hydrogen bonds. The other two water molecules of the formula unit are far from Co^{2+} ion. The crystal has the layer structure parallel to (001), and this causes the perfect cleavage. The structure proposed for this salt by Stroganov *et al.* seems to be incorrect.

* The 1014th report of the Research Institute for Iron, Steel and Other Metals. Published in the Journal of the Physical Society of Japan, **15** (1960), 1412.